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EXAMINER

KATZ, VERA

ART UNIT

PAPER NUMBER

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,765	<b>Applicant(s)</b> TERANISHI ET AL.	
	<b>Examiner</b> VERA KATZ	<b>Art Unit</b> 4152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.  
4a) Of the above claim(s) 30-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29, 38-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

**DETAILED ACTION**

***Elections/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group 1, claim(s) 1-29, and 38-43 drawn to functional coating.

Group 2, claim(s) 30- 37, drawn to a process of applying of functional coatings.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Groups I-II each include the common technical feature expressed in claim 1. However, the technical feature of claim 1 do not constitute a special technical feature because they are not a contribution over the prior art. Japanese Patent Publication JP2001-207123, cited in the International Search Report dated April 13, 2004, shows functional coating as set forth in claim 1.

During a telephone conversation with William Solomon on 07/29/08 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-29 and 38-43. Affirmation of this election must be made by applicant in replying to this Office action. Claims Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR

1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double

patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.30-37 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Information Disclosure Statement***

2      The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining

compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Specification***

3. The disclosure is objected to under 37 CFR 1.71, as being so incomprehensible as to preclude a reasonable search of the prior art by the examiner. For example, the following items are not understood:  $R_y$  is defined as the maximum height of the profile on the surface; and the difference between this number and the average thickness of the functional coating film is 50 nm or greater, see P. 13, lines 20-23 of specification.

There is a term representing the difference between the maximum height of the roughness and the average thickness, see page 14, lines 14-16. It is not clear whether maximum height of the roughness and maximum height of the profile represent same term.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim 5 recites the limitations of deviations of assessed profile (Ra) and haze value of functional coating film.

These limitations are not described in the specification in such a way as to enable one skilled in the appropriate art to use the functional coatings.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 12, 14-25, 27-29 and 38-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 and 38, depending on claims 1 and 2, respectively, recite a surface and it is unclear if it is a base surface, recited in claim 1 or another surface.

Claim 12 describes a fluid for forming a functional layer in combination; it is unclear what combination is recited.

Claims 14, 17 and 39-40 recite "a solvent" multiple times, but it is unclear if it is the same solvent as first recited in the claim, if so, there is an antecedent basis for the second and third time recited and words "the " or "said" should be applied.

Claims 15 and 18, reciting particles having a diameter of 5 to 100 nm to each other over a length of 30 to 300 nm, are vague and indefinite.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 6-8, 10, 11-14, 17, 20-25, 27-29 and 39- 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayashi (US 6,294,313).

As to claim 1, Kobayashi teaches coating film comprising a base material, a primer which coats a surface of the base material and a functional layer (a substrate is considered a base material, a primer is photocatalyst containing layer provided on the substrate, and a layer containing a material which wettability is variable is a functional layer, see column 5, lines 57-60.). However, the functional layer may be a top second photocatalyst-containing layer, according to disclosed embodiments; for example, see Fig. 16 and col. 27, lines 11-38. A primer layer has fine surface roughness and portions formed by unevenly accumulating fine particles. (...the photocatalyst-containing layer having smaller surface roughness, see col. 28, lines 55-58, there is also a term for the average surface roughness, which means that the roughness is uneven, example A-32).

As to claim 2, the primer layer comprises silicone oxide; see col.19, line 43, also col. 21, lines 51-53.

As to claim 4, the diameter of the fine particles is within 5 to 100 nm range; see col.13, lines 47 and 50.

As to claims 6-8, a functional coating layer is a water-repellent coating (the resin layer may be water repellent film, col.10, lines 66-67).

Water repelling film is at least one of fluoroalkyl and alkyl group, (... .fluoroalkyl groups may be bonded to silicon atoms in the silicone, see col.6, lines 1-2). Also col.14, lines 29-30: wherein... Y represents an alkyl, fluoroalkyl).

The alkyl group may include one decyl group; In col. 14 lines 24-29 listed are members of decyl group .

As to claim 10, Examples A-1 and A-3 recite an alkylalkoxysilane (col. 57, line 22 and 58, line 17), which represents a polyalkyleneoxyl group.

As to claim 11, the base is transparent glass plate, (photocatalytic layer provided on a transparent glass substrate; see col. 24, lines 7-8).

As to claims 12 and 13 and 14, the coating material for a functional coating film comprises a fluid containing fine particles of silicon oxide and a fluid for forming functional coatings and the solvent can disperse fine particles of silica, col.18, lines 6-8.

As to claim 17, a mixed solvent comprises a solvent that can disperse and cannot disperse silica, see col. 41, lines 9-16.

Regarding claims 20-21 and 41, the solvent that dissolves the particles comprises a hydrophilic agent and the solvent is an alcohol-based solvent, see col. 18, lines 36-38 and col.31, lines 45-47. Recited is an ethanol, which is a highly hydrophilic solvent, see also Handbook of Solvents, Table 5-3 under heading "Hydrophilic".

Regarding claims 22-23, the solvent that cannot disperse fine particles is non-aqueous solvent and is one of hydrocarbon solvents; for example, see col.23, line 12 reciting ethylene glycol.

As to claim 24, the solvent that cannot disperse fine particles is less volatile; see col. 23, line 18-19.

According to claim 25, see example A-13, col. 62, lines 40-45, wherein titanium oxide is added to the fluid containing silicon oxides. Organic compounds having silicon–oxygen bonding are considered silicon oxide.

As to claims 27-29 and 43, the functional layer is water–repelling film. An embodiment is provided where the functional layer can be formed from a resin comprising fluorocompound or alkyl-comprising rubber; see col. 54, line 12 and 28. The film is an organic coating having at least one of fluoroalkyl or alkyl groups; col.29, line 9.

In another embodiment the functional layer is water-repelling film, see col.10, line67. The film is an organic coating having at least one of fluoroalkyl or alkyl group; col. 29, line 9. The alkyl group is selected from decyl group, col.29, lines 24-25.

Regarding claims 39 and 40, a functional material is a solvent which can disperse fine particles of silicon oxide; col. 18, lines 7-8., or a solvent that cannot disperse fine particles of silicon oxide, col. 23, line 10 and col. 41, line 11.

As to claim 42, metal compound is added to the fluid containing fine particles of silicon oxide; See example A-3, col. 58, lines 23 and 32-33.

3. Claims 1-2, 4, 6-7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Akira (JP-2001-207123).

As to claim 1, Akira teaches a coating film comprising a base, a primer, and a functional coating, (the water-repelling finish, [0011]. It is considered the surface of a substrate to be a base, the 1<sup>st</sup> and 2<sup>nd</sup> rugged surfaces being a primer and a water repelling finish being a functional layer; see paragraph [0008] of machine translation. The primer has fine roughness formed by unevenly accumulated fine particles. (2<sup>nd</sup> surface roughness is smaller than 1<sup>st</sup> surface roughness also ...rugged surface can be formed using phase splitting of a fine diameter of distribution or particles. [0009]).

Considering claim 2, Akira discloses a silicon oxide primer as a main component, (Recited: as a method attaining the 2<sup>nd</sup> surface roughness...containing particles such as colloidal silica [0047].

Considering claim 4, in the example Akira teaches using silicon oxide with a particle diameter of 15 nm [0068]. This value is within applicant's claimed range of 5 to 100 nm.

Considering claims 6-7 and 9, Akira teaches a water-repelling functional coating film having at least a fluoroalkyl group; the members of this group are listed in [0048]. Akira also teaches a contact angle of water droplet on the water-repelling surface of not less than 145 degrees, (157 degrees, which is within applicant's range [0063]).

4. Claims 12- 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa (US 5,324,566).

Ogawa teaches a coating material for forming a primer-with silica (col.2, line 56) with unevenly accumulated fine particles, col.2, lines 34-35; the coating comprises a

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fluid containing the fine particles of silicon oxide and a fluid for functional material by combination, see example 4, col. 21 lines 19-30.

Fine particles of silicon oxide have shapes formed by three dimensional bonding, see col.28, lines 31-33, a solvent can disperse the fine particles of silicon oxide, see col. 16, lines 53-60.

1. Claims 1, 2, 3, 6, 10 and 12-21, 26, 38 and 40-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Doushita (US 6,156,409).

As to claim 1, Doushita teaches a functional coating film comprises a base (recited as a substrate), a primer (a film having metal oxide matrix) and a functional layer (a functional group cover; see the abstract).The primer has fine roughness, (Ra range is 1.5 to 80 nm)

Considering claim 2, the primer layer comprises silica as main component, metal oxide .... Selected from the group consisting of silica...; see col. 2, line 23.

As to claims 6 and 10, the antifouling film is an organic film having a polyalkyleneoxyl group, see col. 17, lines 52-53.

As to claims 3 and 38, Doushita teaches surface roughness of between 1.5 and 80 nm, see col. 7, line 48. In the example recited is thickness of a base with the primer as 100 nm; col. 19, line 13. Further, the functional layer is recited as being, for example, 80 nm thick; col. 20, line 64. The total average thickness of the film is not given in the reference, but can be estimated as a sum of the base-primer and functional coating with the values of 50 nm or greater. Assuming that the maximum surface roughness of 80

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nm is consistent with maximum height of profile; then the difference between this value and the estimated average thickness of the film is 50 nm or greater. Joe, please check

As to claims 12 -14, Doushita teaches a coating material comprising fine particle of silica col. 2, line 23 dispersed in a fluid (in situ, line 40), the shapes are formed by three-dimensional bonding, (in situ, line 66),

As to claim 15 and 18, the particles are having a diameter from 10 to 20 nm over a length from 40 to 300 nm; see col. 3, lines 5-6.

As to claim 16-19, shapes are formed by cyclic bonding of the spherical particles to each other, col. 2, lines 63-66.

As to claim 26, the fluid comprises 1.36% by mass of water and 0.0009 mol per liter catalyst, col. 27, line 24-25, also col. 17, line 50-51.

As to claims 20-21 and 41-42, the solvent comprises a hydrophilic solvent col. 3, line 10, and metal compound can be added to the fluid col. 2, lines 22-28.

2. Claims 1-2, 6-7, 12-13 and 42 are rejected under 35 U.S.C. 102(b) as anticipated by Kamitani (US 2001/0024728).

Kamitani teaches an articles coating with functional coating film, having a substrate, a silicone oxide film and a functional film as in claims 1 and 2, see [0009] and [0010]. Kamitani states an improvement of the smoothness of the film [0205], however, the coatings produced by conventional technique possess some surface roughness or unevenness and this statement means that there is still some residual fine roughness.

Considering claims 6 and 7, a functional layer is a water-repellent layer having fluoroalkyl or alkyl groups, recited in [0194].

As to claims 12-13, the coating comprises a fluid containing fine particles of SiO<sub>2</sub> and fluid for forming functional layer, see [0011] and [0012]. Fine particles have shapes formed by three-dimensional bonding and a solvent can disperse fine particles [0011]. As to claim 42, a metal compound can be added [0015].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being obvious over Doushita ((US 6,156,409) in view of Kamitani (US 2001/0024728). As it was shown above, Doushita teaches all limitations of Claim 1. Doushita also discloses arithmetic mean surface roughness (Ra) of, for example, 25, see Table 4. This value is within applicant's claimed range.

Doushita does not appear to explicitly disclose a haze value of the functional coating film of 1% or smaller.

However, Kamitani teaches a haze value of the functional coating film of smaller than 1%; see page 11, table 12.

Doushita and Kamitani are analogous art because they are from the same field of endeavor related to water-resistant coating art.

At the time of the invention, it would have been obvious to one of ordinary skill in the coating art having the teachings of Doushita and Kamitani before him or her, to modify the functional coatings of Doushita to include the haze value of smaller than 1% of Kamitani because the haze particles and the fog would decrease contact angle and the water-repelling properties of the coating.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VERA KATZ whose telephone number is (571)270-7082. The examiner can normally be reached on M - Th 7:30 -5, F 7:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH DEL SOLE can be reached on 571-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VERA KATZ/  
Examiner, Art Unit 4152

/Joseph S. Del Sole/  
Supervisory Patent Examiner, Art Unit 4152